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BOLLWORM

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BELTSVILLE BRANCH

Bushman '45

a, Eggs; *b*, egg (15 times natural size); *c*, young larva on square; *d*, damaged square; *e*, full-grown larvae showing color differences; *f*, pupa in soil; *g*, adult. Eggs about 15 times natural size; other stages, about natural size.

(See other side for life history and control)

Picture Sheet No. 16

Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, United States Department of Agriculture

BOLLWORM

(*Heliothis armigera* (Hbn.))

Life History

The bollworm damages cotton wherever it is grown in the United States, but the losses are usually greatest in Texas, Oklahoma, and Louisiana. It also feeds on many plants besides cotton, especially corn and tomato, and is known as the corn earworm and the tomato fruitworm. Cotton is not the preferred food plant. Bollworm infestations usually develop rather late in the season, about the time corn silks are drying out and after dusting the boll weevil control has been completed. Each bollworm destroys a large number of squares and bolls, and when bollworms are numerous a crop of cotton can be ruined in a very short time. Damage often occurs so late in the season that the plants do not have time to mature another crop of bolls.

The bollworm moths prefer rapidly growing, succulent cotton in which to lay their eggs. The eggs are laid singly on the tender growth and newly formed squares. They are smaller than the head of an ordinary pin, and pearly white when first laid, but change to a dark color before hatching. The small larvae, or "worms," feed for a few days on the tender buds or leaves and on the outside of squares before burrowing into squares or bolls, usually near the base. Large worms feed almost entirely inside the bolls, so that it is very difficult, if not impossible, to control them. Full-grown larvae enter the soil and change to the pupal, or resting, stage. There are several broods a year. The last brood passes the winter in the underground pupal cells.

Control

When it is about time for bollworms to appear, examine the tops of the plants frequently for eggs and small worms. When 20 to 25 eggs that are beginning to hatch, or this number of eggs and very small worms, are found per 100 plants, it is time to begin dusting. *Successful bollworm control requires heavy applications of dust while the eggs are hatching and before the worms enter the bolls.*

At 5-day intervals apply 10 to 15 pounds per acre of a 10 percent DDT dust, a dust containing 5 percent of DDT plus sufficient benzene hexachloride to give 3 percent of the gamma isomer, or a 20 percent toxaphene dust. Calcium arsenate, lead arsenate, and cryolite are less effective. Whenever the red spider must also be controlled, any mixture containing organic insecticides should include at least 40 percent of sulfur. Use more pounds per acre when the infestation is heavy and the plants are large. Two or three applications will usually control a brood of bollworms, but there may be more than one brood or a steady movement of egg-laying moths to cotton from other crops, with no distinct broods. In such cases several additional applications may be needed to keep the plants covered with insecticides to kill the newly hatched worms. Ladybird beetles and other natural enemies or extremely hot, dry, windy weather often destroys enough eggs and young bollworms to control a threatening infestation without the use of insecticides. Nicotine or benzene hexachloride may be added to the insecticides to prevent aphids from becoming injurious.

Caution.—Insecticides are poisonous and should be handled with care. Store in a dry place where children and animals will not have access to them.

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